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**Parallel PIC Simulations of High-Intensity Short-Pulse Lasers on Dense Targets**

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We present studies of the absorption of short-pulse high-intensity ($I \sim 10^{18} - 10^{21}$ / cm$^2$) laser pulses on thick (0.5-1μm) solid density targets using a domain-decomposed parallel collisional PIC code. The total absorption is largely unaffected by target thickness. For fast risetimes at high intensity ($I \leq 10^{20}$ W / cm$^2$), the ions may experience a collisionless electrostatic shock because the light pressure exceeds the electron kinetic pressure.[1] However, with realistic rise times ($t$ = 100 fs) and thin targets ($l$ = 0.1μm) the electrons achieve energies of several MeV and their pressure exceeds the light pressure, thus no ion shock is observed. As the target thickness is increased, reducing the average electron energy, an ion shock is again observed. We examine the onset of the ion shock while varying the target thickness, pulse length, and plasma composition.

[1] J. Denavit, *Phys. Rev. Lett.* **69**, 3052 (1992).

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